PLAY & LEARN

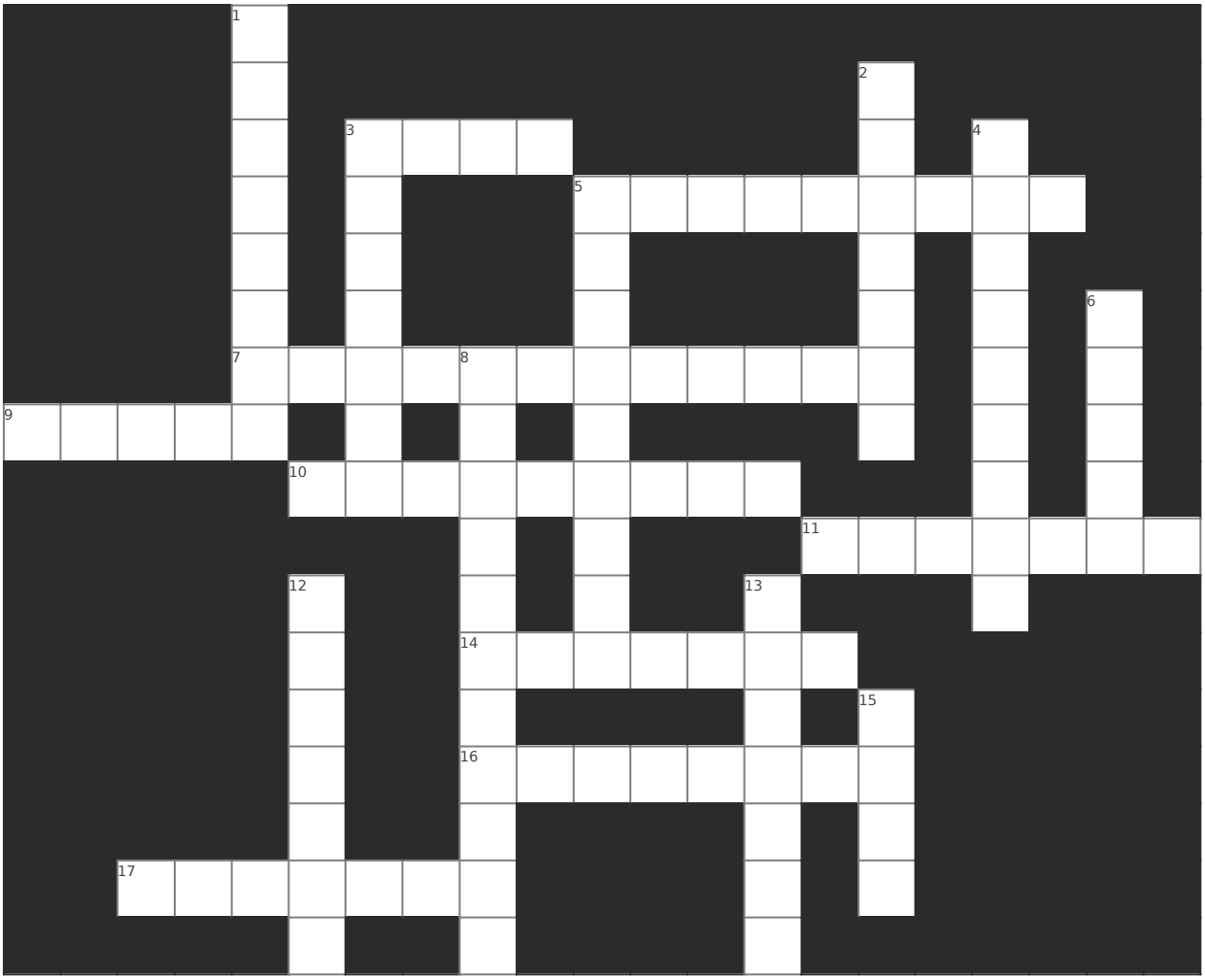
A puzzle workbook — crosswords, word searches, scrambles and quiz games

Print it. Solve it. Race a friend. Answer keys are at the back — no peeking.

#	Puzzle	Play it	Time
1	The Organelle Crossword	Solo or pairs	15 min
2	Cell Safari Word Search	Solo — race the clock	10 min
3	Scrambled Organelles	Solo	8 min
4	Odd One Out	Teams of 4	10 min
5	Cell Scrabble	Groups of 3–4	20 min
6	Who Am I? — 20 Clue Cards	Whole class	15 min
7	True or False Sprint	Whole class, standing	6 min
8	Cell Bingo	Whole class	15 min
9	Two Truths and a Lie	Pairs	10 min
10	The Escape-the-Cell Challenge	Teams of 4	25 min

Puzzle 1 · The Organelle Crossword

Every answer is a word from Chapter 2. Fill the white squares — one letter per square.



ACROSS

3. The basic unit of all life (4)

5. Tangled thread form of DNA in a resting cell (9)

7. The powerhouse of the cell (12)

9. He first saw and named cells, in 1665 (5)

10. What a plant cell wall is mainly made of (9)

11. Division that makes four cells, chromosomes halved (7)

14. Movement of water across a selective membrane (7)

16. The cell’s clean-up and recycling sac (8)

17. The control room holding the DNA (7)

DOWN

1. Tiny structure where proteins are made (8)

2. A shape whose part looks like the whole (7)

3. Folds of the inner mitochondrial membrane (7)

4. Movement from high to low concentration (9)

5. The jelly-like substance filling the cell (9)

6. Apparatus that packs and dispatches (5)

8. Green plastid where photosynthesis happens (11)

12. Storage sac that keeps a plant cell firm (7)

13. Division that makes two identical cells (7)

15. A functional segment of DNA (4)

Bonus words that did not fit the grid — define each one in a sentence: ATP

Puzzle 2 · Cell Safari Word Search

18 terms are hiding in the grid — across, down, diagonally, and backwards. Circle each one, then tick it off the list. Beat 10 minutes and you have earned your microscope.

C	E	L	L	W	A	L	L	D	T	U	R	G	O	R
P	Y	T	F	R	A	C	T	A	L	V	P	I	A	L
J	E	V	O	S	M	O	S	I	S	T	G	Q	F	Y
E	K	V	O	S	U	E	L	C	U	N	D	N	A	P
M	H	K	M	V	I	G	U	S	I	S	O	T	I	M
O	N	Z	Z	Y	G	G	S	I	S	O	I	E	M	M
S	P	L	A	S	T	I	D	H	S	K	G	E	E	P
O	L	B	E	M	O	S	O	B	I	R	I	W	C	I
S	F	D	O	E	N	Z	Y	M	E	P	G	I	G	N
Y	M	U	K	Q	S	T	R	O	M	A	L	P	V	K
L	W	O	E	N	E	G	T	O	K	C	O	B	I	T
B	O	V	W	C	R	I	S	T	A	E	G	I	S	L
H	J	U	Z	S	A	U	E	M	O	G	A	Y	I	H
Y	E	Z	B	U	D	O	D	U	R	U	U	Z	L	C
V	G	G	P	I	F	W	E	L	O	U	C	A	V	A

☐ RIBOSOME	☐ LYSOSOME	☐ CELLWALL
☐ NUCLEUS	☐ VACUOLE	☐ CRISTAE
☐ PLASTID	☐ OSMOSIS	☐ MITOSIS
☐ MEIOSIS	☐ FRACTAL	☐ STROMA
☐ ENZYME	☐ TURGOR	☐ GOLGI
☐ HOOKE	☐ GENE	☐ DNA

Race Rules

- **Solo:** find all 18. Note your time at the top of the page.
- **Pairs:** one partner finds across-and-down words, the other finds diagonals. First pair to complete the list wins.
- **Hard mode:** cover the word list. Find as many biology terms as you can in 5 minutes.
- **Champion move:** for every word you find, say its function out loud. No function, no point.

Puzzle 3 · Scrambled Organelles

Every row is a Chapter 2 word with its letters shuffled. Unscramble it. The clue in brackets is your lifeline — try to solve without it first.

#	Scrambled letters	Clue	Your answer
1	R S C H O M O E M O	(rod-shaped, visible just before division)	_____
2	T E Y O P K R R A O	(a cell with no true nucleus)	_____
3	E M M A B R N E	(the selectively permeable boundary)	_____
4	R R U G T O	(the pressure that keeps a plant firm)	_____
5	R S I N A N F A	(the red stain used on onion peel)	_____
6	A M A B O E	(moves by flowing, has no cell wall)	_____
7	E I T M R P L O H H E	(heat-loving bacterium of Puga Valley)	_____
8	K O C L E T E Y S T O N	(the fine fibre network inside a cell)	_____
9	O I T E N C T O P T Y	(one plant cell can regrow a whole plant)	_____
10	B O Y S D I O M I E N S S	(how mitochondria may have joined the cell)	_____

Make It a Game

Beat the Bell: the teacher sets a 60-second timer. Every unscrambled word inside the bell = 1 point; a word you can also *define* = 3 points.

Chain Scramble: in a circle, each student scrambles a Chapter 2 word for the person on their left. Miss it and you are out. Last student standing wins.

Puzzle 4 · Odd One Out

Three belong together. One does not. Circle the odd one — then write why in one line. The "why" is where the marks are.

#	Which is the odd one out?	Because…
1	Nucleus · Mitochondrion · Cell wall · Golgi apparatus	_____
2	Chlorophyll · Chromoplast · Leucoplast · Ribosome	_____
3	Hooke · Schleiden · Schwann · Newton	_____
4	Osmosis · Diffusion · Photosynthesis · Concentration gradient	_____
5	Bacteria · Yeast · Virus · Amoeba	_____
6	Cristae · Villi · Alveoli · Cell sap	_____
7	Mitosis · Meiosis · Gametes · Chromosome halving	_____
8	Onion peel · Cheek cell · Spinach leaf · Potato cell	_____

Puzzle 5 · Cell Scrabble

Play in groups of 3–4. You have one shared rack of letter tiles. Build only biology terms from Chapter 2 — no ordinary English words allowed.

Your tile rack — cut these out or write them on paper squares:

A 1	**B** 3	**C** 3	**D** 2	**E** 1	**G** 2	**H** 4
I 1	**L** 1	**M** 3	**N** 1	**O** 1	**P** 3	**R** 1
S 1	**T** 1	**U** 1	**V** 4	**X** 8	**Y** 4	**Z** 10

Scoring:

You did this	Points
Each letter tile used	Its tile value
Word is a Chapter 2 term	× 2
Word is 8 letters or longer	+ 10 bonus
You can state its function correctly	+ 5
You can name where in the cell it sits	+ 3
Word is *not* in Chapter 2 (challenged and lost)	− 5

How a Round Works

1. Player builds a word from the rack and lays it down.
2. Any opponent may **challenge** within 10 seconds: "That's not in Chapter 2."
3. Open the textbook. If the challenger is right, the word is removed and the builder loses 5 points. If the challenger is wrong, the *challenger* loses 5 points.
4. Builder states the function to claim the +5 bonus. The group votes on whether it was correct.
5. Play 6 rounds. Highest total wins.

Target Words (worth the most — do not show your opponents)

MITOCHONDRIA · ENDOSYMBIOSIS · TOTIPOTENCY · CYTOSKELETON · CHROMOPLAST · SELECTIVELY PERMEABLE · PROKARYOTE · CHLOROPLAST · HYPERTONIC · CENTRIFUGE

Puzzle 6 · Who Am I? — 20 Clue Cards

Cut along the lines. One student draws a card and reads only the first clue aloud; the class guesses. Wrong guess? Read clue 2. Fewer clues used = more points.

CARD 1 ① I am folded over and over. ② I make the cell's energy. ③ They call me the powerhouse.	**CARD 2** ① I am green. ② I trap sunlight. ③ Without me, no photosynthesis.
CARD 3 ① I am a sac full of enzymes. ② I break down the broken. ③ The cell's recycling van.	**CARD 4** ① I am the biggest thing in a plant cell. ② I am full of watery sap. ③ When I empty, the plant wilts.
CARD 5 ① I am rigid, and only plants, fungi and bacteria have me. ② I am made of cellulose. ③ I stop the cell from bursting.	**CARD 6** ① I hold the instructions. ② I have pores in my double coat. ③ I am the control room.
CARD 7 ① I am tiny and I come in two subunits. ② I sit free or stuck to the ER. ③ I build proteins.	**CARD 8** ① I stack like flattened pouches. ② I wrap and label. ③ I am the cell's post office.
CARD 9 ① I am water on the move. ② I need a selectively permeable membrane. ③ Salt on kairi proves I exist.	**CARD 10** ① I make two, not four. ② My daughters are identical. ③ I heal your cuts.
CARD 11 ① I make four, not two. ② I halve the chromosome number. ③ Without me, no variation.	**CARD 12** ① I look like a tangled thread. ② I condense before division. ③ Then I become a chromosome.
CARD 13 ① I have no nucleus and I live in your curd. ② I double every 20 minutes. ③ I am Lactobacillus.	**CARD 14** ① I am not a cell at all. ② I am genetic material in a protein coat. ③ I must invade to multiply.
CARD 15 ① I looked at cork in 1665. ② I thought of monks' rooms. ③ I named the cell.	**CARD 16** ① I said all plants are made of cells. ② The year was 1838. ③ My partner did animals a year later.
CARD 17 ① I proved cells come only from cells. ② The year was 1855. ③ I completed the Cell Theory.	**CARD 18** ① Any part of me, magnified, looks like all of me. ② Trees, coastlines and lungs wear my pattern. ③ I am a fractal.
CARD 19 ① I am 70 square metres folded into your chest. ② I do gas exchange. ③ I am the alveoli.	**CARD 20** ① I lost my nucleus to carry more oxygen. ② I live about 120 days. ③ I am a red blood cell.

Scoring: guessed after clue ① = **5 points** · after ② = **3 points** · after ③ = **1 point**

Puzzle 7 · True or False Sprint

Everyone stands. Teacher reads a statement. True → stay standing. False → sit down. Get it wrong and you are out. Last student standing wins.

#	Statement	Your call
1	All cells have a nucleus.	☐ True ☐ False
2	The cell wall is made of cellulose.	☐ True ☐ False
3	Osmosis needs a selectively permeable membrane.	☐ True ☐ False
4	Viruses are the smallest living cells.	☐ True ☐ False
5	Mitochondria have their own DNA.	☐ True ☐ False
6	Animal cells have a large central vacuole.	☐ True ☐ False
7	Meiosis produces four daughter cells.	☐ True ☐ False
8	Robert Hooke saw living cells under his microscope.	☐ True ☐ False
9	Cristae increase the surface area for making ATP.	☐ True ☐ False
10	A potato in salt water gains weight.	☐ True ☐ False
11	Cancer cells ignore contact inhibition.	☐ True ☐ False
12	Chloroplasts are found in every plant cell.	☐ True ☐ False
13	A fractal looks the same at different magnifications.	☐ True ☐ False
14	The lysosome builds proteins.	☐ True ☐ False
15	Bacteria are prokaryotic.	☐ True ☐ False
16	Programmed cell death is always harmful.	☐ True ☐ False

Puzzle 8 · Cell Bingo

Each student fills the empty grid below with any 16 words from the word bank — in any order, one per box. The teacher then reads out functions, not names. Cross a box only when its function is called. First to a full row, column or diagonal shouts BINGO.

Word bank — choose any 16:

Nucleus	Mitochondria	Ribosome	Lysosome
Golgi apparatus	Vacuole	Chloroplast	Cell wall
Cell membrane	Cytoplasm	Chromosome	Gene
Osmosis	Diffusion	Mitosis	Meiosis
Cristae	Chromatin	Prokaryote	Eukaryote
Cellulose	ATP	Nucleolus	Plastid

Your bingo card:

> **□ Caller’s List (teacher only — read the function, never the name)**
>
> ① "I release energy as ATP." ② "I am made of cellulose." ③ "I package and dispatch proteins." ④ "I store cell sap and keep the plant firm." ⑤ "I break down worn-out organelles." ⑥ "I build proteins." ⑦ "I hold the DNA." ⑧ "I trap sunlight." ⑨ "I am the jelly everything floats in." ⑩ "I decide what enters and leaves." □ "Water crosses me from dilute to concentrated." □ "I halve the chromosome number." □ "I make two identical daughter cells." □ "I am the folded inner membrane." □ "I am a cell with no true nucleus." □ "I am a functional segment of DNA."

Puzzle 9 · Two Truths and a Lie

Each set has three statements. Two are true, one is a lie. Circle the lie — and correct it in one line.

Set 1

(a) Mitochondria have their own DNA.
(b) Chloroplasts are found in all plant cells.
(c) Both mitochondria and chloroplasts have double membranes.

The lie is _____ . Corrected: _____

Set 2

(a) A cheek cell has no cell wall.
(b) An onion cell shrinks completely in sugar solution.
(c) Cheek cells are used in DNA testing kits.

The lie is _____ . Corrected: _____

Set 3

(a) Prokaryotes are 1–10 µm across.
(b) Prokaryotes have membrane-bound organelles.
(c) Bacteria are prokaryotes.

The lie is _____ . Corrected: _____

Set 4

(a) The alveoli of your lungs total about 70 m^2.
(b) Folding increases surface area without increasing volume much.
(c) A smooth membrane would give the same surface area as cristae.

The lie is _____ . Corrected: _____

Set 5

(a) Meiosis happens in all body cells.
(b) Meiosis produces gametes.
(c) Meiosis creates genetic variation.

The lie is _____ . Corrected: _____

Set 6

(a) Robert Hooke named the cell in 1665.
(b) Virchow showed cells arise from pre-existing cells.
(c) Schleiden proved all animals are made of cells.

The lie is _____ . Corrected: _____

Puzzle 10 · Escape the Cell

You have been shrunk and injected into a plant cell. To escape you must pass five gates. Each gate gives you one digit. Collect all five to unlock the exit code.

GATE 1 — The Membrane

How many nanometres thick is a cell membrane, at the lower end of the range? That number is your **first digit**.

Digit: ☐

GATE 2 — The Powerhouse

Count the letters in the folds of the inner mitochondrial membrane (the word itself). That count minus 0 is your **second digit**.

Digit: ☐

GATE 3 — The Nucleus

A mature red blood cell survives about 120 days. Take the first digit of that number. That is your **third digit**.

Digit: ☐

GATE 4 — The Wall

In which year did Robert Hooke name the cell? Add the last two digits together (6 + 5). That is your **fourth digit**.

Digit: ☐

GATE 5 — The Fractal Gate

How many times do the bronchioles of a human lung branch? Take the first digit. That is your **fifth digit**.

Digit: ☐

EXIT CODE: ☐ ☐ ☐ ☐ ☐

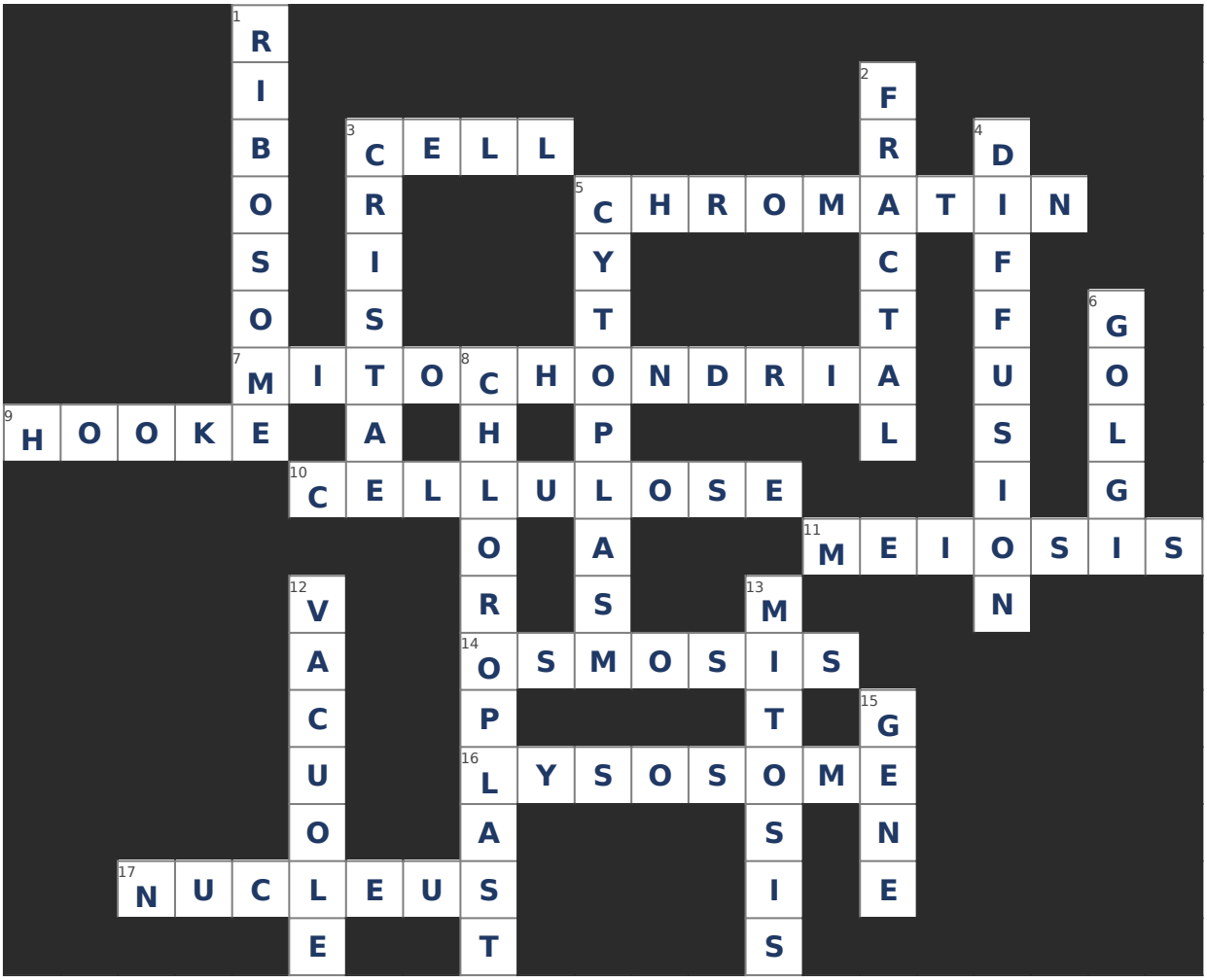
Teacher's note

Hide the five gate cards around the classroom. Teams rotate every 4 minutes. First team to reach the door with the correct five-digit code escapes the cell. Losing teams get "reabsorbed by a lysosome."

Answer Keys

Teachers and self-checkers only. Solve first — the puzzle is the point.

Puzzle 1 · Crossword — Solved Grid


1 R I B O S O
2 F R A C T T
3 C E L L
R I S
4 D I F F U S I O N
5 C H R O M A T I N
Y T
6 G O L G I
7 M I T O C H O N D R I A
8 H O O K E
H A P L
9 C E L L U L O S E
10 O A
11 M E I O S I S
12 V A C U O L E
R S
13 M N
14 O S M O S I S
P T
15 G E N E
16 L Y S O S O M E
A S
17 N U C L E U S
I
S

Across: 3 CELL · 5 CHROMATIN · 7 MITOCHONDRIA · 9 HOOKE · 10 CELLULOSE · 11 MEIOSIS · 14 OSMOSIS · 16 LYSOSOME · 17 NUCLEUS

Down: 1 RIBOSOME · 2 FRACTAL · 3 CRISTAE · 4 DIFFUSION · 5 CYTOPLASM · 6 GOLGI · 8 CHLOROPLAST · 12 VACUOLE · 13 MITOSIS · 15 GENE

Puzzle 2 · Word Search — Solved Grid

C	**E**	**L**	**L**	**W**	**A**	**L**	**L**	D	**T**	**U**	**R**	**G**	**O**	**R**
P	Y	T	**F**	**R**	**A**	**C**	**T**	**A**	**L**	V	P	I	A	L
J	E	V	**O**	**S**	**M**	**O**	**S**	**I**	**S**	T	G	Q	F	Y
E	K	V	O	**S**	**U**	**E**	**L**	**C**	**U**	**N**	**D**	**N**	**A**	P
M	H	K	M	V	I	G	U	**S**	**I**	**S**	**O**	**T**	**I**	**M**
O	N	Z	Z	Y	G	G	**S**	**I**	**S**	**O**	**I**	**E**	**M**	M

S	**P**	**L**	**A**	**S**	**T**	**I**	**D**	H	S	K	G	E	E	P
O	L	B	**E**	**M**	**O**	**S**	**O**	**B**	**I**	**R**	**I**	W	C	I
S	F	D	O	**E**	**N**	**Z**	**Y**	**M**	**E**	P	**G**	I	G	N
Y	M	U	**K**	Q	**S**	**T**	**R**	**O**	**M**	**A**	**L**	P	V	K
L	W	**O**	**E**	**N**	**E**	**G**	T	O	K	C	**O**	B	I	T
B	**O**	V	W	**C**	**R**	**I**	**S**	**T**	**A**	**E**	**G**	I	S	L
H	J	U	Z	S	A	U	E	M	O	G	A	Y	I	H
Y	E	Z	B	U	D	O	D	U	R	U	U	Z	L	C
V	G	G	P	I	F	W	**E**	**L**	**O**	**U**	**C**	**A**	**V**	A

Puzzle 3 · Scrambled Organelles

1. CHROMOSOME · 2. PROKARYOTE · 3. MEMBRANE · 4. TURGOR · 5. SAFRANIN · 6. AMOEBA · 7. THERMOPHILE · 8. CYTOSKELETON · 9. TOTIPOTENCY · 10. ENDOSYMBIOSIS

Puzzle 4 · Odd One Out

#	Odd one	Because
1	Cell wall	The only one absent from animal cells
2	Ribosome	The only one that is not a plastid/pigment
3	Newton	The only one who is not a cell biologist
4	Photosynthesis	The only one not a transport process
5	Virus	The only one that is not a cell
6	Cell sap	The only one that is not a folded surface
7	Mitosis	The only one not connected with halving/gametes
8	Cheek cell	The only animal cell — the rest are plant cells

Puzzle 7 · True or False Sprint

1-F · 2-T · 3-T · 4-F · 5-T · 6-F · 7-T · 8-F · 9-T · 10-F · 11-T · 12-F · 13-T · 14-F · 15-T · 16-F

Puzzle 9 · Two Truths and a Lie

Set	The lie	Correction
1	(b)	Chloroplasts are absent from root cells and other non-green tissue

Set	The lie	Correction
2	(b)	The onion cell’s wall keeps its outline; only the contents shrink
3	(b)	Prokaryotes have no membrane-bound organelles
4	(c)	A smooth membrane would give far less surface area than folded cristae
5	(a)	Meiosis happens only in reproductive organs
6	(c)	Schleiden did plants; Schwann did animals

Puzzle 10 · Escape the Cell

EXIT CODE: 7 · 7 · 1 · 1 · 2

Gate 1: membrane is 7–10 nm thick → 7. Gate 2: CRISTAE has 7 letters → 7. Gate 3: 120 days → 1. Gate 4: 1665 → 6+5 = 11 → 1. Gate 5: 23 branchings → 2.

Now go build the clay cell model — and see if you can fold the cristae enough times to beat your own record. □□